Hands-On

CO Switch Decommissioning & Service Migration

Central Office

Course Description

Wireline switches are providing a special challenge today despite ongoing migration to triple-play and wireless technologies, there is still some resilient need for reliable, low-latency POTS telephone service. This requires continuing effort to find economical yet reliable ways to run the TDM switching network.

The CO Switch Decommissioning & Service Migration Course has been designed by request to help telcos lower the cost of running existing plant as reliably and easily as possible. In addition to power savings and asset harvesting, the course helps to show how to dump usage reports, find, and then utilize the correct de-growth procedures without generating permanent alarms from improperly deleted hardware. Additional considerations are reviewed per the scope of work, including system RC requirements, adjacent & co-located equipment risk, and reversion procedures. Equipment may be considered for abandon-in-place (AIP) versus bay removal, understanding that adjacent cable runs may actually still support other critical equipment. Battery-power removal, spikes, and separate grounds are also reviewed. Students are taken through the original switch manufacturer documentation, such as NTPs, GTEPs, Practices, plus certain Bellcore/Telcordia, NEBS, and NEC standards, as necessary for a project. The course has several optional components, depending upon your scope of work, including proper Recent Change (RC) procedure, system backups, plus how to migrate service to other network elements, including several unified VoIP or fiber communication products. Many telco techs have little background in data networking. The course can optionally provide some basics of packet-based voice networks which includes a summary of routers & switches, the OSI model, and IPv4/IPv6, plus how a TDM voice circuit interfaces to, and operates with, a VoIP or MPLS network. Concepts like Cisco CUCM VoIP, or Genband and Metaswitch MPLS migration are explained.

The actual course length is flexible with the content, and can be adjusted depending upon the needs of the class.

Students Will Learn

- **Common Switching System Components**
- **Modern Voice Networks Theory of Operation**
- **Input-Output Commands**

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- **Documentation**
- **Decommissioning a Peripheral Module**
- **Migration Procedures**
- **Block Diagrams & Job Aids**
- **And More...**

Target Audience

Technical staff such as Central Office Technicians, Installation, Electricians, NOC/SCC, Recent Change/Verify, and others responsible for the replacement and re-grading of central office switching systems.

Prerequisites

A good understanding of TDM telecommunications and switching principles is suggested due to the accelerated nature of the course. IP Networking knowledge is not required, but may be helpful depending upon curriculum. Those with no previous switching background may wish to consider a maintenance-level or switching overview class.

Course Outline

Module 1: Common Switching System Components

- Tip and Ring, T1R1, E&M

- Lines and Trunks

- Digital Signals: ADC, DAC

- Codecs (G.711, G.729, etc.)

- TDM, FDM, PCM

- Multiplexing: copper, light

- Carrier: DS1, AMI, B8ZS

- Stored Program Control Systems

- PSTN

- Triple-Play Services incl. light FDM, filters, ONTs

- VoIP: SIP, SCCS, H.323, RTP

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Module 2: Modern Voice Networks: Theory of Operation

- Time-Space-Time
    - Time Slot Count (TSC)
    - Switching/Space Matrix
    - Blocking & Concentration Ratio
- Switch Operation (platform dependent)
    - 5ESS, DMS-10/DMS-100/DMS-200/DMS-500, GTD-5, EWSD, DCO
    - Processor Types: Admin/SN, Switching/SM/TCU/LTG, etc.
    - Peripherals: Line/Trunk modules, BRI/PRI
    - Remotes: RDT, GR-303
    - Phone Call Sequence of Events (incl. SS7)
- Voice-over-IP Systems
    - The OSI Model (esp. L1 thru L4)
    - Switches & Routers, incl. MAC, IPv4/IPv6
    - VoIP Theory of Operation
    - Cisco model: CME Router, FXS, FXO
    - Virtual PBX Managers: 3CX, etc.
- MPLS Systems
    - TDM & MPLS Convergence
    - MPLS vendors (Cisco, Metaswitch, Genband, etc.)

Module 3: Input-Output Commands

- IO Terminals - CLI, GUI, Poke/MAP/etc., Procomm Plus
- 5ESS, DMS-10/DMS-100/DMS-200/DMS-500, GTD-5, EWSD Commands
    - Command Syntax
    - Operator/Device/Device Assignments
    - Summary
- Sample Commands: (platform dependent - such as RST/MAPCI/PUT/ADD/CR, etc.)

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- Sample Commands: RC & RC/V, reports (switch utilization)
- Command Scripting: Procomm, PowerTerm, Order-Input systems
- Examples

Module 4: Documentation

- Support & Provisioning Documentation
    - Users Guides - DynaText, Helmsman, Worldview, EDDS (as appropriate)
    - OEM Practices/NTP
    - Technical Specification - Bellcore/Telcordia Standards
    - NEBS, NIST, NEC Standards
- Card & Equipment Documentation
    - Engineering Documents
    - Hardware Matrixes
    - Recent Change/RCV
- IP/MPLS Documentation/SRNDs - i.e. Unified Communications Managers
- Review

Module 5 : Decommissioning a Peripheral Module

- Process Overview/Scope of Work
    - NOC/SCCS Communication
- Locate the Procedure (i.e. de-growth)
    - RTU/RC Patch Issues
    - Minimum Configuration Requirements
- Trial Changes
    - Check Session
    - Test Hardware Prior to Turn-down
    - Alarm Clearing

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Regression Testing

System Backup

- Module Cutover

Running Script Files

Reversion Procedure

- Identification of Cabling & Hardware

Grounding: frame, electrical, lightning, isolated, & office grounds

Fusing, Power Distribution

Fiber Optics

System-Interop Considerations

- Removal or AIP

- Power Down Procedures

Alarm Verification

Module 6 : Migration Procedures

- Process Overview/Desired Outcome

- Locate the Procedure (i.e. growth) (platform dependent such as Call Manager)

- Test Circuit

Voice, Data, Video components (as needed)

Test Hardware

Alarm Clearing

- Service Cutover

Running Script Files

Regression Testing

Alarm Verification

Reversion Procedure

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Module 7 : Block Diagrams & Job Aids

- CO Switch Functional Block Diagram
- POTS Call Example
- Migration Functional Block Diagram
- Sample Delete/Add LEN - same system
- Sample Delete/Add LEN - new system (incl. rack move)
- Cisco CUCM/CLI - create POTS service, basic North American Dial Plan, dial peers

Notes

Can be coordinated with an Overview, Maintenance, or Translations course for a customized curriculum

Delivery Method

Instructor-Led with numerous exercises and examples throughout.

Equipment Requirements

(This apply's to our hands-on courses only)

BTS always provides equipment to have a very successful Hands-On course. BTS also encourages all attendees to bring their own equipment to the course. This will provide attendees the opportunity to incorporate their own gear into the labs and gain valuable training using their specific equipment.

Course Length

5 Days

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